

# Total Maximum Daily Load (TMDL) Implementation Plan



Greenvale, Beach and Paynes Creeks  
Lancaster County

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VA Dept. of Conservation and Recreation  
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# Acknowledgements

**Steering Committee Members**

**Working Group Members**

Northern Neck Soil and Water Conservation District

Lancaster County Governments

VA Department of Conservation and Recreation

VA Department of Environmental Quality

VA Department of Health –Division of Shellfish Sanitation

Northern Neck Planning District Commission

Friends of Lancaster County

Local citizens and stakeholders in the Greenvale, Beach and Paynes  
Creeks watersheds

# What is a TMDL Implementation Plan?

- TMDL study tells us what we need to do, TMDL implementation plan tells us **how**
- Outlines **actions** that can be taken to meet TMDL allocations
- Serves as a **guide** for implementation efforts



Photo courtesy of  
Amanda Schwab

# Implementation Plan Sections

- Review of TMDL document
- Public Participation
- Implementation Actions
- Measurable Goals & Milestones
- Stakeholder Roles & Responsibilities
- Integration with Other Watershed Plans
- Potential Funding Sources



Photo courtesy of Mark Alling, DEQ



# Review of TMDL Development

- Impairment Description
- Watershed Characteristics
- Water Quality Monitoring
- Water Quality Modeling
- Potential Sources
- Allocations Specified

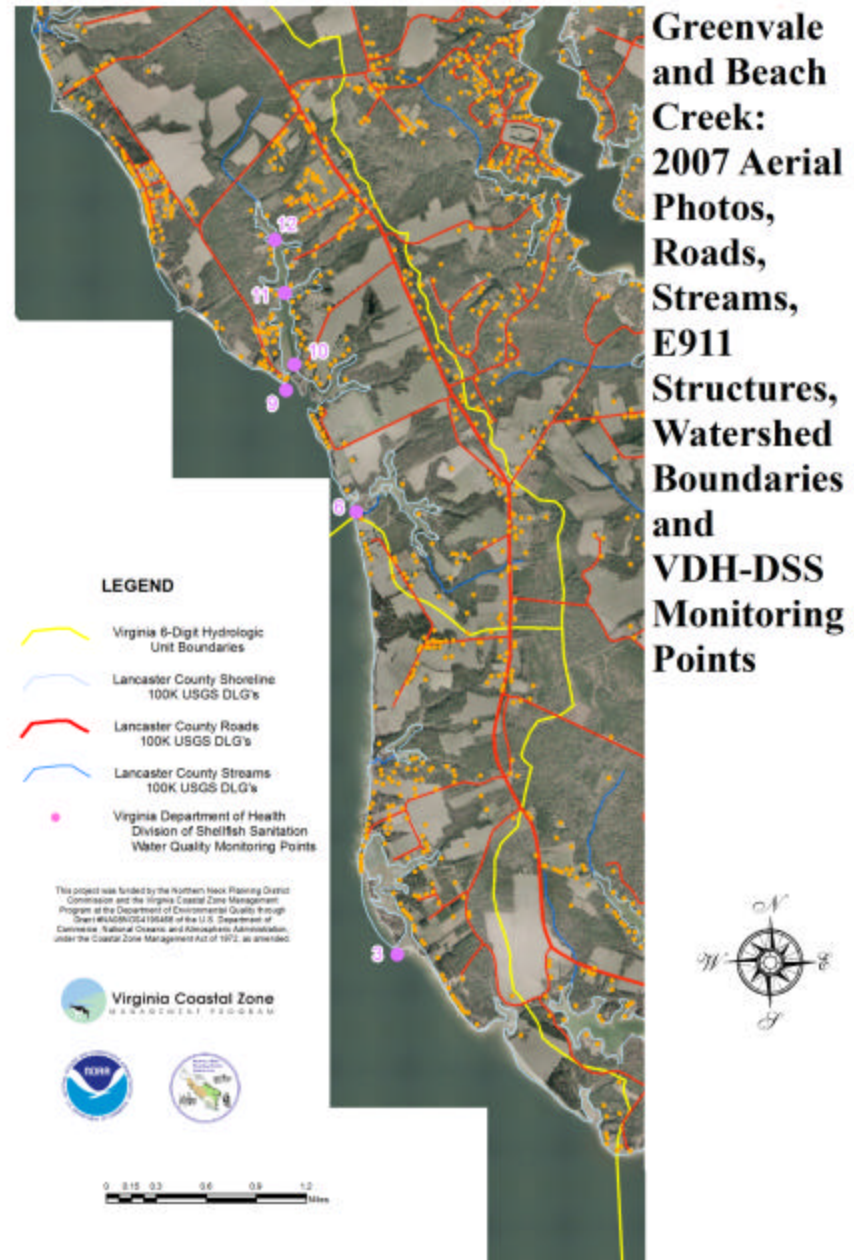


Photo courtesy of Eddy Whichard

# IP Area Description

TMDLs Developed:

- Greenvale
- Beach



# Public Participation

- Public Meetings (2)
- Steering Committee (1)
- Working Groups
  - Business (2)
  - Residential/Recreational (2)
  - Government (1)

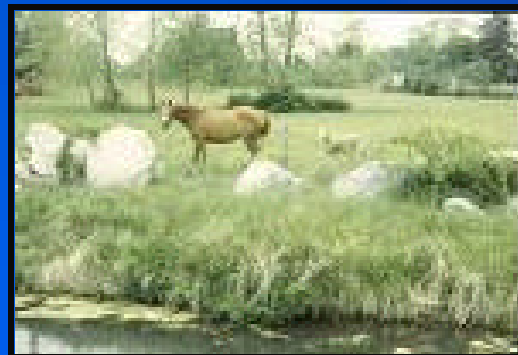


# How Citizens Helped Develop This Implementation Plan

- Provided additional detail on watershed
- Reviewed/suggested technical and educational solutions
- Identified potential implementation impediments
- Identified local funding sources/partnerships
- Began supplemental water quality monitoring



# Implementation Actions



# Bacteria Source Reassessment

Greenvale Creek								
FC Class	FC Sources	Greenvale Creek	FC Production Rate (See Appendix B)	Calculated Daily FC Production (FC/day)	Daily FC Production by Class (FC/day)	Contribution Factor	Calculated Daily FC Contribution to Creek (FC/day)	Calculated Daily FC Contribution by Class (FC/day)
Human	Households	146						
	Septic	127	5.00E+09	6.35E+11		0.01	6.35E+09	
	Failing Septic (10%)	15	5.00E+09	7.50E+10	8.04E+11	0.11	8.25E+09	3.78E+10
	No Treatment (3%)	4	5.00E+09	2.00E+10		1.00	2.00E+10	
	Biosolids	116	2.00E+06	7.19E+10		0.01	7.19E+08	
	Boat Slips	99	5.00E+09	2.48E+09		1.00	2.48E+09	
Livestock	BST Load							
	Horse	0	4.20E+08	0.00E+00		0.01	0.00E+00	
	Cattle	0	1.10E+11	0.00E+00		0.01	0.00E+00	
	Pig	0	5.50E+09	0.00E+00	8.39E+09	0.01	0.00E+00	8.39E+07
	Sheep	0	1.50E+10	0.00E+00		0.01	0.00E+00	
	Chicken	0	1.90E+08	0.00E+00		0.01	0.00E+00	
	Poultry Litter	150	4.50E+04	8.39E+09		0.01	8.39E+07	
Pet	BST Load							
	Dog	138	5.00E+09	6.88E+11	6.88E+11	0.03	2.07E+10	2.07E+10
Wildlife	BST Load							
	Deer	33	2.50E+08	8.25E+09		0.03	2.48E+08	
	Duck	61	7.75E+09	4.73E+11	3.97E+12	0.26	1.23E+11	6.09E+11
	Geese	42	1.63E+10	6.85E+11		0.26	1.78E+11	
	Muskrat	0	3.40E+07	0.00E+00		0.26	0.00E+00	

# Efficiency of Practices in Reducing Fecal Coliform

## Phase 1 Practice Efficiencies

Practice	DCR Practice Number	Per Unit Cost	Reduction Efficiency	Cost Efficiency
Small Acreage Grazing System	SL-6AT	1,500	2.58E+08	1.72E+05
Vegetated Buffer on Cropland	WQ-1	400	1.69E+08	4.23E+05
Septic Tank Pump Out	RB-1	220	5.00E+06	2.27E+04
Septic System Repair	RB-3	3,000	4.13E+08	1.38E+05
Septic System Installation/Replacement	RB-4	6,000	3.75E+09	6.25E+05
Septic System Installation/Replacement with Pump	RB-4P	6,500	3.75E+09	5.77E+05
Alternative on Site Systems	RB-5	25,000	3.75E+09	1.50E+05
Recreational Boater Education Programs		5,000	7.43E+08	1.49E+05
Residential Education Programs		5,000	1.51E+10	3.02E+06
Watermen Education Programs		5,000	1.88E+10	3.76E+06
Vegetated Buffers		400	1.50E+08	3.75E+05
Residential Pet Waste Composters		100	1.90E+08	1.90E+06
Public Pet Waste Collection Facility/Signage/Supplies		700	1.50E+09	2.14E+06

# BMPs Needed for Greenvale, Paynes and Beach Creeks

Agricultural BMPs		
#	Units	Practice
2	System	Small Acreage Grazing System
25	Acres	Vegetated Buffers

Residential BMPs		
#	Units	Practice
224	System	Septic Tank Pump Out
23	System	Septic System Repair
8	System	Septic System Installation/Replacement
4	System	Septic System Installation/Replacement with Pump
4	System	Alternative Waste Treatment System
46	Acres	Vegetated Buffer
75	System	Pet Waste Composter



# BMPs Needed for Greenvale, Paynes and Beach Creeks

## Education Programs

#	Units	Practice
1	Program	Boater Education Program
3	Program	Residential Education Program
1	Program	Watermen Education Program

## Other BMPs

#	Units	Practice
3	System	Public Pet Waste Collection Facility/Signage/Supplies

# Phased Implementation

## Greenvale, Paynes and Beach Creeks

- **Paynes and Beach Creeks** - Calculated benefits indicate water quality standards will be met upon implementation of the identified BMPs.
- **Greenvale Creek** - Calculated benefits indicate water quality standards will not be met upon implementation of the identified BMPs.
- **Greenvale Creek** – If sampling reveals Phase 1 implementation has not met water quality standards, local citizens may elect to move forward with Phase 2 implementation to address the fecal coliform contribution from wildlife through a wildlife management plan
  - Alternatively, a use attainability analysis (UAA) may be initiated to reflect the presence of naturally high bacteria levels due to uncontrollable sources. The outcome of the UAA may lead to the determination that the designated use(s) of the waters may need to be changed to reflect the attainable use(s).

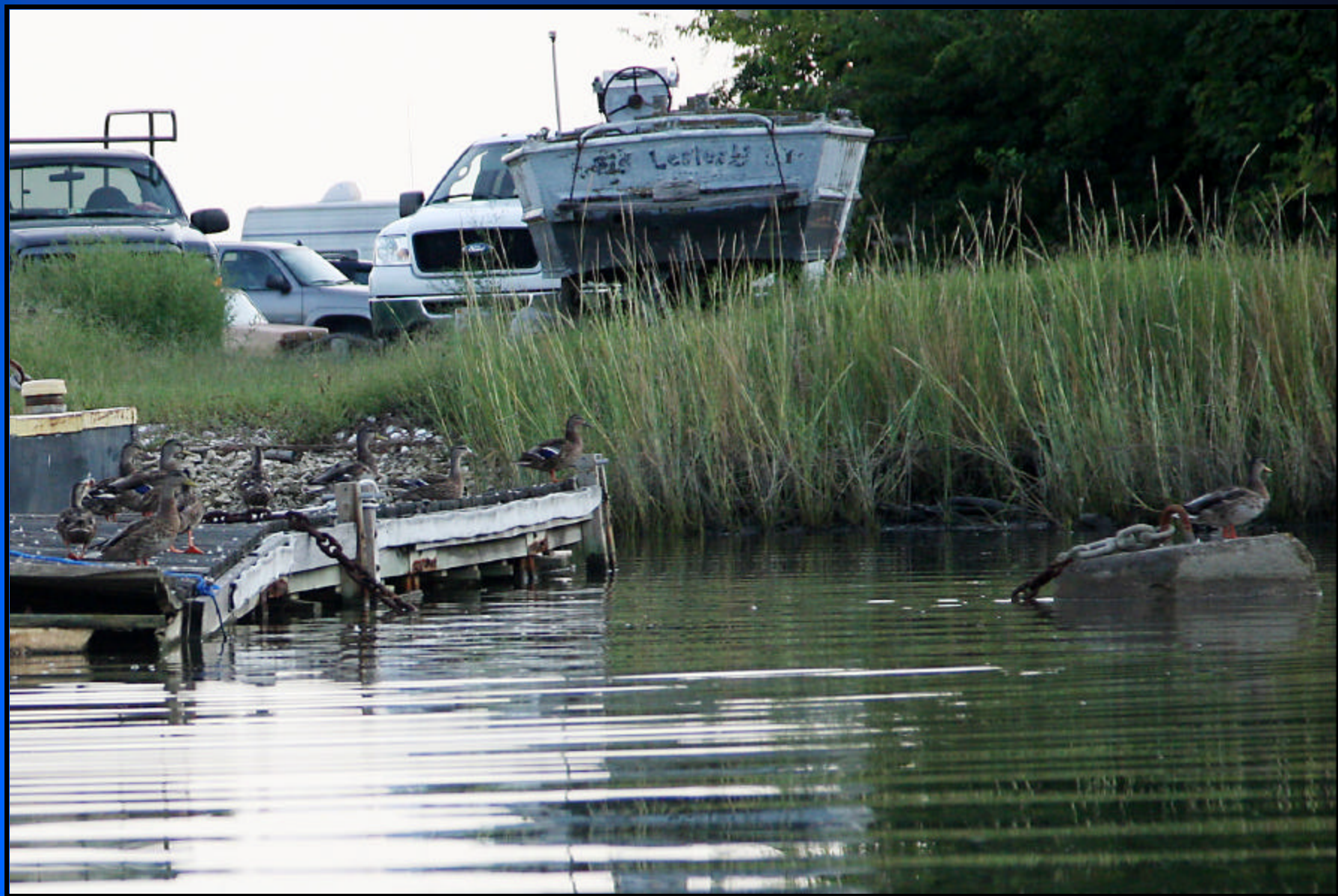


Photo courtesy of Amanda Schwab

Implementation Costs				
Units	Practice	DCR Practice Number	Per Unit Cost	Estimated Cost
2	Small Acentage Grazing System	SL-6AT	\$ 1,500	\$ 3,000
25	Vegetated Buffer on Cropland	WQ-1	\$ 400	\$ 10,000
224	Septic Tank Pump Out	RB-1	\$ 220	\$ 49,300
23	Septic System Repair	RB-3	\$ 3,000	\$ 69,000
8	Septic System Installation/Replacement	RB-4	\$ 6,000	\$ 48,000
4	Septic System Installation/Replacement with Pump	RB-4P	\$ 6,500	\$ 26,000
4	Alternative on Site Systems	RB-5	\$25,000	\$ 100,000
1	Recreational Boater Education Programs		\$ 5,000	\$ 5,000
3	Residential Education Programs		\$ 5,000	\$ 15,000
1	Watermen Education Programs		\$ 5,000	\$ 5,000
46	Vegetated Buffers		\$ 400	\$ 18,400
75	Residential Pet Waste Composters		\$ 100	\$ 7,500
3	Public Pet Waste Collection Facility/Signage/Supplies		\$ 700	\$ 2,100
Phase 1 Total				\$ 358,300
Optional - Phase 2 Implementation Costs				
1	Wildlife Management Program		\$10,000	\$ 10,000
Optional - Phase 2 Total				\$ 10,000
Total				\$ 368,300



# Implementation Benefits

## Greenvale, Paynes and Beach Creeks

- Water quality may be improved by reducing bacterial loads in these creeks.
- Property owners growing oysters in these creeks using dockside floats would no longer need to transport their floats to clean water to depurate the oysters prior to consumption.
- The residential programs may provide additional return on the investment in terms of economic benefits to homeowners.
- The replacement of failing on-site sewage disposal systems with new septic or alternative treatment systems will have a direct and substantial impact, improving property values and investing in the local economy.

# Phase 1 Implementation Timeline

## Year 1

- Residential education program focused on nuisance wildlife management
- Septic BMPs to correct the deficiencies identified in the 2009 shoreline sanitary survey
- Septic pump outs identified by Lancaster County's enforcement program

## Year 2

- Residential education program focused on pet waste management
- Residential pet waste composters
- Vegetated Buffers on Residential Land
- Septic pump outs

## Year 3

- Education programs for watermen and recreational boaters
- Small Acreage Grazing System
- Vegetated Buffers on cropland
- Septic pump outs

# Phase 1 Implementation Timeline (continued)

## **Year 4**

- Residential education program on onsite treatment system operations and maintenance
- Public pet waste collection facilities
- Vegetated Buffers on Residential Land
- Septic pump outs

## **Year 5**

- Complete any BMPs or education programs that were not able to be completed as scheduled
- Septic tank pump outs

# Phase 1 Implementation Milestones

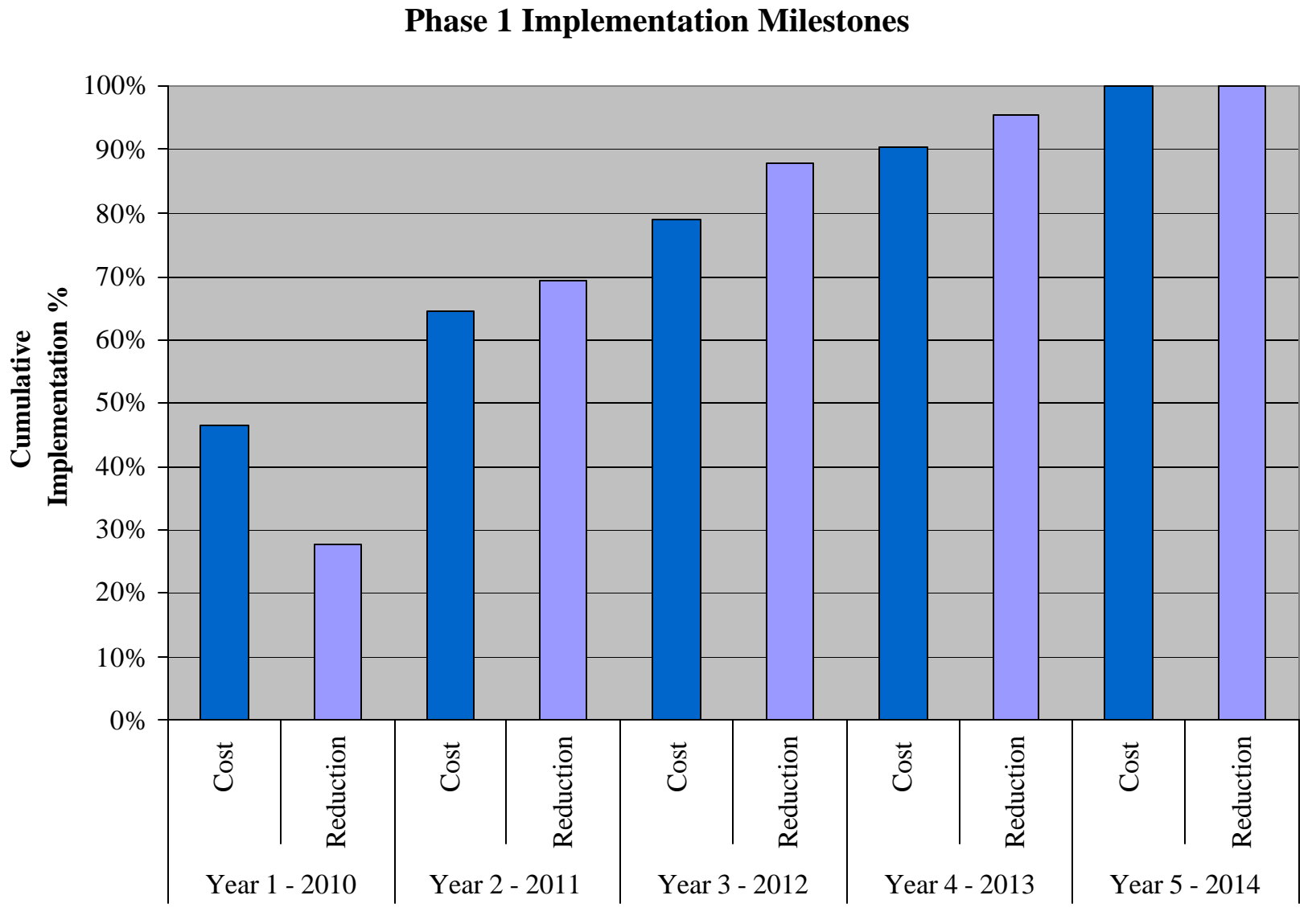






Photo courtesy of Amanda Schwab

# Water Quality Monitoring



Photo of Oyster Floats, courtesy of Nick Ferriter

- Established VDH-DSS bacteriological stations
- Citizen Water Quality Monitors: Monthly Coliscan Easygel for *E-coli*

# Stakeholder Roles and Responsibilities

- Inform DCR about perceived pollutant sources
- Enlighten DCR about on-going/needed pollution control activities
- Review possible implementation strategies from a interest-based perspective
- Discuss alternative funding sources/partnerships
- Identify outreach methods for engaging peers in implementing pollution control measures
- Identify constraints to implementing pollution control measures

# Stakeholders

## Regional & Local

- Northern Neck Planning District Commission
- Northern Neck Soil and Water Conservation District
- Lancaster County
- Friends of Lancaster County, Residents of Greenvale, Beach and Paynes Creeks, Tidewater Oyster Growers Association

## Federal

- USDA -Natural Resources Conservation Service
- United States Environmental Protection Agency



# Stakeholders (continued)

## State

- Virginia Department of Conservation and Recreation
- Virginia Department of Environmental Quality
- Virginia Department of Health – Division of Shellfish Sanitation
- Virginia Department of Agricultural & Consumer Services
- Virginia Cooperative Extension
- Virginia Department of Forestry
- Virginia Department of Game and Inland Fisheries

# Funding Sources

- Water Quality Improvement Fund
- VA Agricultural Best Management Cost Share
- VA Agricultural Best Management Tax Credits
- VA Small Business Environmental Assistance Loan
- Community Development Block Grant
- Conservation Reserve Program
- Wildlife Habitat Incentive Program
- Wetland Reserve Program
- National Fish and Wildlife Foundation
- River Counties Community Foundation
- Northern Neck Planning District Commission
- Friends of the Rappahannock

Comments on the Draft IP may be submitted to:



Scene along Greenvale Creek, Courtesy  
of Eddy Whichard

May Louise Sligh, VA Dept. of Conservation and Recreation

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